

## Physical Properties and Resistant Starch Content of Rice Flour Residues Hydrolyzed by $\alpha$ -Amylase

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**Abstract :** Enzymatic modification of rice flour can produce highly functional derivatives use in food industries. This study aimed to evaluate the physical properties and resistant starch content of rice flour residues hydrolyzed by  $\alpha$ -amylase. Rice flour hydrolyzed by  $\alpha$ -amylase (60 and 300 u/g) for 1, 24 and 48 hours were investigated. Increasing enzyme concentration and hydrolysis time resulted in decreased rice flour residue's lightness ( $L^*$ ) but increased redness ( $a^*$ ) and yellowness ( $b^*$ ) of rice flour residues. The resistant starch content and peak viscosity increased when hydrolysis time increased. Pasting temperature, trough viscosity, breakdown, final viscosity, setback and peak time of the hydrolyzed flours were not significantly different ( $p > 0.05$ ). The morphology of native flour was smooth without observable pores and polygonal with sharp angles and edges. However, after hydrolysis, granules with a slightly rough and porous surface were observed and a rough and porous surface was increased with increasing hydrolyzed time. The X-ray diffraction patterns of native flour showed A-type configuration, which hydrolyzed flour showed almost 0% crystallinity indicated that both amorphous and crystalline structures of starch were simultaneously hydrolyzed by  $\alpha$ -amylase.

**Keywords :**  $\alpha$ -Amylase, enzymatic hydrolysis, pasting properties, resistant starch

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